VICTOZA® (liraglutide) injection, for subcutaneous use

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use VICTOZA® safely and effectively. See full prescribing information for VICTOZA®.

VICTOZA® (liraglutide) injection, for subcutaneous use

Initial U.S. Approval: 2010

WARNING: RISK OF THYROID C−CELL TUMORS
See full prescribing information for complete boxed warning.

- Liraglutide causes thyroid C-cell tumors at clinically relevant exposures in both genders of rats and mice. It is unknown whether VICTOZA® causes thyroid C-cell tumors, including medullary thyroid carcinoma (MTC), in humans, as the human relevance of liraglutide-induced rodent thyroid C-cell tumors has not been determined (5.1, 13.1).
- VICTOZA® is contraindicated in patients with a personal or family history of MTC or in patients with Multiple Endocrine Neoplasia syndrome type 2 (MEN 2). Counsel patients regarding the potential risk of MTC and the symptoms of thyroid tumors (4, 5.1).

INDICATIONS AND USAGE

VICTOZA® is a glucagon−like peptide−1 (GLP−1) receptor agonist indicated:
- as an adjunct to diet and exercise to improve glycemic control in patients 10 years and older with type 2 diabetes mellitus (1).
- to reduce the risk of major adverse cardiovascular events in adults with type 2 diabetes mellitus and established cardiovascular disease (1).

Limitations of Use:
- Not for treatment of type 1 diabetes mellitus.
- Should not be coadministered with other liraglutide-containing products.

----------- DOSAGE AND ADMINISTRATION -----------

- Inspect visually prior to each injection. Only use if solution is clear, colorless, and contains no particles (2.1).
- Inject VICTOZA® subcutaneously once-daily at any time of day, independently of meals, in the abdomen, thigh or upper arm (2.1).
- When using VICTOZA® with insulin, administer as separate injections. Never mix (2.1).
- Adult Dosage: Initiate at 0.6 mg daily for one week then increase to 1.2 mg daily. If additional glycemic control is required, increase the dose to 1.8 mg daily after one week of treatment with the 1.2 mg dose (2.2).
- Pediatric Dosage: Initiate at 0.6 mg daily for at least one week. If additional glycemic control is required increase the dose to 1.2 mg daily and if additional glycemic control is still required, increase the dose to 1.8 mg daily after at least one week of treatment with the 1.2 mg dose (2.3).

------- ADVERSE REACTIONS -------

The most common adverse reactions, reported in ≥5% of patients treated with VICTOZA® are:
- nausea, diarrhea, vomiting, decreased appetite, dyspepsia, constipation (6.1).

To report SUSPECTED ADVERSE REACTIONS, contact Novo Nordisk Inc. at 1–877–484–2869 or FDA at 1–800–FDA–1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS

Oral Medications: VICTOZA® delays gastric emptying and may impact absorption of concomitantly administered oral medications (7). Concomitant Use with an Insulin Secretagogue (e.g., Sulfonylurea) or with Insulin: when initiating, consider reducing the dose of concomitantly administered insulin secretagogues (such as sulfonylureas) or insulin to reduce the risk of hypoglycemia (7).

USE IN SPECIFIC POPULATIONS

- Pregnancy: VICTOZA® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus (8.1).

See 17 for PATIENT COUNSELING INFORMATION and FDA-Approved Medication Guide. Revised: 11/2020

FULL PRESCRIBING INFORMATION: CONTENTS*

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VICTOZA® (liraglutide) injection 1.2 mg, 1.8 mg

FULL PRESCRIBING INFORMATION

WARNING: RISK OF THYROID C−CELL TUMORS

Liraglutide causes dose-dependent and treatment-duration-dependent thyroid C−cell tumors at clinically relevant exposures in both genders of rats and mice. It is unknown whether VICTOZA® causes thyroid C−cell tumors, including medullary thyroid carcinoma (MTC), in humans, as the human relevance of liraglutide-induced rodent thyroid C−cell tumors has not been determined [see Warnings and Precautions (5.1) and Nonclinical Toxicology (13.1)].

VICTOZA® is contraindicated in patients with a personal or family history of MTC or in patients with MEN 2. Counsel patients regarding the potential risk for MTC with the use of VICTOZA® and inform them of symptoms of thyroid tumors (e.g., a mass in the neck, dysphagia, dyspnea, persistent hoarseness). Routine monitoring of serum calcitonin or using thyroid ultrasonography is of uncertain value for early detection of MTC in patients treated with VICTOZA® [see Contraindications (4) and Warnings and Precautions (5.1)].

1 INDICATIONS AND USAGE

VICTOZA® is indicated:

• as an adjunct to diet and exercise to improve glycemic control in patients 10 years and older with type 2 diabetes mellitus,
• to reduce the risk of major adverse cardiovascular events (cardiovascular death, non-fatal myocardial infarction, or non-fatal stroke) in adults with type 2 diabetes mellitus and established cardiovascular disease [see Clinical Studies (14.3)].

Limitations of Use:

VICTOZA® should not be used in patients with type 1 diabetes mellitus.

VICTOZA® contains liraglutide and should not be coadministered with other liraglutide-containing products.

2 DOSAGE AND ADMINISTRATION

2.1 Important Dosing and Administration Instructions

• Inspect visually prior to each injection. Only use if solution is clear, colorless, and contains no particles.
• Inject VICTOZA® subcutaneously once-daily at any time of day, independently of meals.
• Inject VICTOZA® subcutaneously in the abdomen, thigh or upper arm. No dose adjustment is needed if changing the injection site and/or timing.
• When using VICTOZA® with insulin, administer as separate injections. Never mix.
• It is acceptable to inject VICTOZA® and insulin in the same body region but the injections should not be adjacent to each other.
• If a dose is missed, resume the once-daily regimen as prescribed with the next scheduled dose. Do not administer an extra dose or increase the dose to make up for the missed dose.
• If more than 3 days have elapsed since the last VICTOZA® dose, reinstitute VICTOZA® at 0.6 mg to mitigate any gastrointestinal symptoms associated with reinitiation of treatment. Upon reinitiation, VICTOZA® should be titrated at the discretion of the prescriber.

2.2 Adult Dosage

• Initiate VICTOZA® with a dose of 0.6 mg daily for one week. The 0.6 mg dose is a starting dose intended to reduce gastrointestinal symptoms during initial titration, and is not effective for glycemic control in adults. After one week at 0.6 mg per day, increase the dose to 1.2 mg daily.
• If additional glycemic control is required, increase the dose to 1.8 mg daily after at least one week of treatment with the 1.2 mg daily dose.

2.3 Pediatric Dosage

• Initiate VICTOZA® with a dose of 0.6 mg daily.
• After at least one week at 0.6 mg daily, the dose may be increased to 1.2 mg daily if additional glycemic control is required.
• If additional glycemic control is required, increase the dose to 1.8 mg daily after at least one week of treatment with the 1.2 mg daily dose.

3 DOSAGE FORMS AND STRENGTHS

Injection: 18 mg/3 mL (6 mg/mL) clear, colorless solution in a pre-filled, single-patient-use pen that delivers doses of 0.6 mg, 1.2 mg, or 1.8 mg.

4 CONTRAINDICATIONS

• Medullary Thyroid Carcinoma

VICTOZA® is contraindicated in patients with a personal or family history of medullary thyroid carcinoma (MTC) or in patients with Multiple Endocrine Neoplasia syndrome type 2 (MEN 2).

• Hypersensitivity

VICTOZA® is contraindicated in patients with a prior serious hypersensitivity reaction to liraglutide or to any of the excipients in VICTOZA®. Serious hypersensitivity reactions including anaphylactic reactions and angioedema have been reported with VICTOZA® [see Warnings and Precautions (5.6)].

5 WARNINGS AND PRECAUTIONS

5.1 Risk of Thyroid C−cell Tumors

Liraglutide causes dose-dependent and treatment-duration-dependent thyroid C−cell tumors (adenomas and/or carcinomas) at clinically relevant exposures in both genders of rats and mice [see Nonclinical Toxicology (13.1)]. Malignant thyroid C−cell carcinomas were detected in rats and mice. It is unknown whether VICTOZA® will cause thyroid C−cell tumors, including medullary thyroid carcinoma (MTC), in humans, as the human relevance of liraglutide-induced rodent thyroid C−cell tumors has not been determined.

Cases of MTC in patients treated with VICTOZA® have been reported in the postmarketing period; the data in these reports are insufficient to establish or exclude a causal relationship between MTC and VICTOZA® use in humans.

VICTOZA® is contraindicated in patients with a personal or family history of MTC or in patients with MEN 2. Counsel patients regarding the potential risk for MTC with the use of VICTOZA® and inform them of symptoms of thyroid tumors (e.g., a mass in the neck, dysphagia, dyspnea, persistent hoarseness). Routine monitoring of serum calcitonin or using thyroid ultrasonography is of uncertain value for early detection of MTC in patients treated with VICTOZA®. Such monitoring may increase the risk of unnecessary procedures, due to low test specificity for serum calcitonin and a high background incidence of thyroid disease. Significantly elevated serum calcitonin may indicate MTC and patients with MTC usually have calcitonin values >50 ng/L. If serum calcitonin is measured and found to be elevated, the patient should be further evaluated. Patients with thyroid nodules noted on physical examination or neck imaging should also be further evaluated.

5.2 Pancreatitis

Based on spontaneous postmarketing reports, acute pancreatitis, including fatal and non-fatal hemorrhagic or necrotizing pancreatitis, has been observed in patients treated with VICTOZA®. After initiation of VICTOZA®, observe patients carefully for signs and symptoms of pancreatitis (including persistent severe abdominal pain, sometimes radiating to the back and which may or may not be accompanied by vomiting). If pancreatitis is suspected, VICTOZA® should promptly be discontinued and appropriate management should be initiated. If pancreatitis is confirmed, VICTOZA® should not be restarted.

In glycemic control trials of VICTOZA®, there have been 13 cases of pancreatitis among VICTOZA®-treated patients and 1 case in a comparator (glimepiride) treated patient (2.7 vs. 0.5 cases per 1000 patient-years). Nine of the 13 cases with VICTOZA® were reported as acute pancreatitis and four were reported as chronic pancreatitis. In one case in a VICTOZA®-treated patient, pancreatitis, with necrosis, was observed and led to death; however clinical causality could not be established. Some patients had other risk factors for pancreatitis, such as a history of cholecystitis or alcohol abuse.

VICTOZA® has been studied in a limited number of patients with a history of pancreatitis. It is unknown if patients with a history of pancreatitis are at higher risk for development of pancreatitis on VICTOZA®.

5.3 Never Share a VICTOZA® Pen Between Patients

VICTOZA® pens must never be shared between patients, even if the needle is changed. Pen-sharing poses a risk for transmission of blood-borne pathogens.

5.4 Hypoglycemia

Adult patients receiving VICTOZA® in combination with an insulin secretagogue (e.g., sulfonylurea) or insulin may have an increased risk of hypoglycemia, including severe hypoglycemia. In pediatric patients 10 years of age and older, the risk of hypoglycemia was higher with VICTOZA® regardless of insulin and/or metformin use [see Adverse Reactions (6.1), Drug Interactions (7.2)].

The risk of hypoglycemia may be lowered by a reduction in the dose of sulfonylurea (or other concomitantly administered insulin secretagogues) or insulin. Inform patients using these concomitant medications and pediatric patients of the risk of hypoglycemia and educate them on the signs and symptoms of hypoglycemia.

5.5 Renal Impairment

VICTOZA® has not been found to be directly nephrotoxic in animal studies or clinical trials. There have been postmarketing reports of acute renal failure and worsening of chronic renal failure, which may sometimes require hemodialysis in VICTOZA®-treated patients [see Adverse Reactions (6.2)]. Some of these events were reported in patients without known underlying renal disease. A majority of the reported events occurred in patients who had experienced nausea, vomiting, diarrhea, or dehydratation [see Adverse Reactions (6.1)]. Some of the reported events occurred in patients receiving one or more medications known to affect renal function or hydration status. Altered renal function has been reversed in many of the reported cases with supportive treatment and discontinuation of potentially causative agents, including VICTOZA®. Use caution when initiating or escalating doses of VICTOZA® in patients with renal impairment [see Use in Specific Populations (8.6)].

5.6 Hypersensitivity Reactions

There have been postmarketing reports of serious hypersensitivity reactions (e.g., anaphylactic reactions and angioedema) in patients treated with VICTOZA®. If a hypersensitivity reaction occurs, discontinue VICTOZA®, treat promptly per standard of care, and monitor until signs and symptoms resolve. Do not use in patients with a previous hypersensitivity reaction to VICTOZA® [see Contraindications (4)].

Anaphylaxis and angioedema have been reported with other GLP-1 receptor agonists. Use caution in a patient with a history of anaphylaxis or angioedema with another GLP-1 receptor agonist because it is unknown whether such patients will be predisposed to these reactions with VICTOZA®.

5.7 Acute Gallbladder Disease

In the LEADER trial [see Clinical Studies (14.3)], 3.1% of VICTOZA®-treated patients versus 1.9% of placebo-treated patients reported an acute event of gallbladder disease, such as cholecystitis or cholecystolithiasis. The majority of events required hospitalization or cholecystectomy. If cholecystitis is suspected, gallbladder studies and appropriate clinical follow-up are indicated.

6 ADVERSE REACTIONS

The following serious adverse reactions are described below or elsewhere in the prescribing information:

• Risk of Thyroid C−cell Tumors [see Warnings and Precautions (5.1)]
• Pancreatitis [see Warnings and Precautions (5.2)]
• Hypoglycemia [see Warnings and Precautions (5.4)]
• Renal Impairment [see Warnings and Precautions (5.5)]
• Hypersensitivity Reactions [see Warnings and Precautions (5.6)]

6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.
Common Adverse Reactions

The safety of VICTOZA® in subjects with type 2 diabetes was evaluated in 5 glycemic control, placebo-controlled trials in adults and one trial of 52 weeks duration in pediatric patients 10 years of age and older [see Clinical Studies (14.1)]. The data in Table 1 reflect exposure of 1673 adult patients to VICTOZA® and a mean duration of exposure to VICTOZA® of 37.3 weeks. The mean age of adult patients was 58 years, 4% were 75 years or older and 54% were female. The population was 73% White, 6% Black or African American, 13% Asian; 4% were of Hispanic or Latino ethnicity. At baseline the population had diabetes for an average of 9.1 years and a mean HbA1c of 8.4%. Baseline estimated renal function was normal or mildly impaired in 88.1% and moderately impaired in 11.9% of the pooled population.

Table 1 shows common adverse reactions in adults, excluding hypoglycemia, associated with the use of VICTOZA®. These adverse reactions occurred more commonly on VICTOZA® than on placebo and occurred in at least 5% of patients treated with VICTOZA®. Overall, the type and severity of adverse reactions in adolescents and children aged 10 years and above were comparable to those observed in the adult population.

### Table 1  Adult Incidence (%) and Rate (episodes/patient year) of Hypoglycemia in 26-Week Combination Therapy Placebo-controlled Trials

<table>
<thead>
<tr>
<th>Hypoglycemia</th>
<th>Placebo Comparator</th>
<th>VICTOZA® Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 661</td>
<td>N = 645</td>
<td>N = 1024</td>
</tr>
<tr>
<td>Nausea</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Headache</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>2%</td>
<td>6%</td>
</tr>
<tr>
<td>Decreased appetite</td>
<td>1%</td>
<td>10%</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>6%</td>
<td>6%</td>
</tr>
</tbody>
</table>

In an analysis of placebo- and active-controlled trials, the types and frequency of common adverse reactions, excluding hypoglycemia, were similar to those listed in Table 1.

### Other Adverse Reactions

#### Gastrointestinal Adverse Reactions

In the pool of 5 glycemic control, placebo-controlled clinical trials, withdrawals due to gastrointestinal adverse reactions, occurred in 4.3% of VICTOZA®-treated patients and 0.5% of placebo-treated patients. Withdrawal due to gastrointestinal adverse events mainly occurred during the first 2-3 months of the trials.

#### Hypoglycemia

In 5 adult glycemic control, placebo-controlled clinical trials of at least 26 weeks duration, hypoglycemia requiring the assistance of another person for treatment occurred in 8 VICTOZA®-treated patients (7.5 events per 1000 patient-years). Of these 8 VICTOZA®-treated patients, 7 patients were concomitantly using a sulfonylurea.

### Table 2  Adult Incidence (%) and Rate (episodes/patient year) of Hypoglycemia in 26-Week Combination Therapy Placebo-controlled Trials

<table>
<thead>
<tr>
<th>Hypoglycemia</th>
<th>Placebo Comparator</th>
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<tr>
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</tbody>
</table>

In one glycemic control trial in renal impairment patients, a mean increase of 33% for lisipe and 15% for amylase from baseline was observed for VICTOZA®-treated patients while placebo-treated patients had a mean decrease in lisipe and a mean increase in amylase of 1%.

In the LEADER trial, serum lipase and amylase were routinely measured. Among VICTOZA®-treated patients, 7.9% had a lipase value at any time during treatment of greater than or equal to 3 times the upper limit of normal compared with 4.5% of placebo-treated patients, and 1% of VICTOZA®-treated patients had an amylase value at any time during treatment of greater than or equal to 3 times the upper limit of normal versus 0.7% of placebo-treated patients.

The clinical significance of elevations in lipase or amylase with VICTOZA® is unknown in the absence of other signs and symptoms of pancreatitis [see Warnings and Precautions (5.2)].

### Vital Signs

VICTOZA® did not have adverse effects on blood pressure. Mean increases from baseline in heart rate of 2 to 3 beats per minute have been observed with VICTOZA® compared to placebo.

### 6.2 Immunogenicity

Consistent with the potentially immunogenic properties of protein and peptide pharmaceuticals, patients treated with VICTOZA® may develop anti-liraglutide antibodies. The detection of antibody formation is highly dependent on the sensitivity and specificity of the assay. Additionally, the observed incidence of antibody (including neutralizing antibody) positivity in an assay may be influenced by several factors including assay methodology, sample handling, timing of sample collection, concomitant medications, and underlying disease. For these reasons, the incidence of antibodies to liraglutide cannot be directly compared with the incidence of antibodies to other products.

Approximately 50-70% of VICTOZA®-treated patients in five double-blind clinical trials of 26 weeks duration or longer were tested for the presence of anti-liraglutide antibodies at the end of treatment. Low titers (concentrations not requiring dilution of serum) of anti-liraglutide antibodies were detected in 8.6% of these VICTOZA®-treated patients. Cross-reacting anti-liraglutide antibodies to native glucagon-like peptide-1 (GLP-1) occurred in 6.9% of the VICTOZA®-treated patients in the double-blind 52-week monotherapy trial and in 4.8% of the VICTOZA®-treated patients in the double-blind 26-week add-on combination therapy trials. These cross-reacting antibodies were not tested for neutralizing effect against native GLP-1, and thus the potential for clinically significant neutralization of native GLP-1 was not assessed. Antibodies that had a neutralizing effect on liraglutide in an in vitro assay occurred in 2.3% of the VICTOZA®-treated patients in the double-blind 52-week monotherapy trial and in 1.0% of the VICTOZA®-treated patients in the double-blind 28-week add-on combination therapy trials.

Antibody formation was not associated with reduced efficacy of VICTOZA® when comparing mean HbA1c of all antibody-positive and all antibody-negative patients. However, the 3 patients with the highest titers of anti-liraglutide antibodies had no reduction in HbA1c with VICTOZA® treatment.

In five double-blind glycemic control trials of VICTOZA®, events from a composite of adverse events potentially related to immunogenicity (e.g., urticaria, angioedema) occurred among 0.8% of VICTOZA®-treated patients and among 0.4% of comparator-treated patients. Urticaria accounted for approximately one-half of the events in this composite for VICTOZA®-treated patients. Patients who developed anti-liraglutide antibodies were not more likely to develop events from the immunogenicity composite than were patients who did not develop anti-liraglutide antibodies.

In the LEADER trial [see Clinical Studies (14.3)], anti-liraglutide antibodies were detected in 11 out of the 1247 (0.9%) VICTOZA®-treated patients with antibody measurements. Of the 11 VICTOZA®-treated patients who developed anti-liraglutide antibodies, none were observed to develop neutralizing antibodies to liraglutide, and 5 patients (0.4%) developed cross-reacting antibodies against native GLP-1.
VICTOZA® (liraglutide) injection 1.2 mg, 1.8 mg

In a clinical trial with pediatric patients 10 to 17 years [see Clinical Studies (14.2)], anti-liraglutide antibodies were detected in 1 (1.5%) VICTOZA® treated patient at week 26 and 5 (8.5%) VICTOZA® treated patients at week 53. None of the 5 had antibodies cross reactive to native GLP-1 or had neutralizing antibodies.

6.3 Post-Marketing Experience

The following additional adverse reactions have been reported during post-approval use of VICTOZA®. Because these events are reported voluntarily from a population of uncertain size, it is generally not possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

- Medullary thyroid carcinoma
- Dehydration resulting from nausea, vomiting and diarrhea.
- Increased serum creatinine, acute renal failure or worsening of chronic renal failure, sometimes requiring hemodialysis.
- Angioedema and anaphylactic reactions.
- Allergic reactions: rash and pruritus
- Acute pancreatitis, hemorrhagic and necrotizing pancreatitis sometimes resulting in death
- Hepatobiliary disorders: elevations of liver enzymes, hepatitis

7 DRUG INTERACTIONS

7.1 Oral Medications

VICTOZA® causes a delay of gastric emptying, and thereby has the potential to impact the absorption of concomitantly administered oral medications. In clinical pharmacology trials, VICTOZA® did not affect the absorption of the tested orally administered medications to any clinically relevant degree. Nonetheless, caution should be exercised when oral medications are concomitantly administered with VICTOZA®.

7.2 Concomitant Use with an Insulin Secretagogue (e.g., Sulfonylureas) or with Insulin

When initiating VICTOZA®, consider reducing the dose of concomitantly administered insulin secretagogues (such as sulfonylureas) or insulin to reduce the risk of hypoglycemia [see Warnings and Precautions (5.4) and Adverse Reactions (6)].

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

Based on animal reproduction studies, there may be risks to the fetus from exposure to VICTOZA® during pregnancy. VICTOZA® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Animal reproduction studies identified increased adverse developmental outcomes from exposure during pregnancy. Liraglutide exposure was associated with early embryonic deaths and an imbalance in some fetal abnormalities in pregnant rats administered liraglutide during organogenesis at doses that approximate clinical exposures at the maximum recommended human dose (MRHD) of 1.8 mg/day. In pregnant rabbits administered liraglutide during organogenesis, decreased fetal weight and an increased incidence of major fetal abnormalities were seen at exposures below the human exposures at the MRHD [see Animal Data].

The estimated background risk of major birth defects for women with uncontrolled pre-gestational diabetes (Hemoglobin A1C >7) is 6 to 10%. The major birth defect rate has been reported to be as high as 20 to 25% in women with a Hemoglobin A1C >10. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively.

Clinical Considerations

Disease-associated maternal and/or embryofetal risk

Poorly controlled diabetes in pregnancy increases the maternal risk for diabetic ketoacidosis, pre-eclampsia, spontaneous abortions, preterm delivery, and delivery complications. Poorly controlled diabetes increases the fetal risk for major birth defects, still birth, and macrosomia related morbidity.

Animal Data

Female rats given subcutaneous doses of 0.1, 0.25 and 1.0 mg/kg/day liraglutide beginning 2 weeks before mating through gestation day 17 had estimated systemic exposures 0.8-, 3-, and 11-times the human exposure at the MRHD based on plasma AUC comparison. The number of early embryonic deaths in the 1 mg/kg/day group increased slightly. Fetal abnormalities and variations in kidney and blood vessels, irregular ossification of the skull, and a more complete state of ossification occurred at all doses. Mottled liver and minimally kinked ribs occurred at the highest dose. The incidence of fetal malformations in liraglutide-treated groups exceeding concurrent and historical controls were misshapen orpharynx and/or narrowed opening into larynx at 0.1 mg/kg/day and umbilical hernia at 0.1 and 0.25 mg/kg/day.

Pregnant rabbits given subcutaneous doses of 0.01, 0.025 and 0.05 mg/kg/day liraglutide from gestation day 6 through day 18 inclusive, had estimated systemic exposures less than the human exposure at the MRHD of 1.8 mg/day at all doses, based on plasma AUC. Liraglutide decreased fetal weight and dose-dependently increased the incidence of total major fetal abnormalities at all doses. The incidence of malformations exceeded concurrent and historical controls at 0.01 mg/kg/day (kidneys, scapula), >0.01 mg/kg/day (eyes, forelimb), 0.025 mg/kg/day (brain, tail and sacral vertebrae, major blood vessels and heart, umbilicus), >0.025 mg/kg/day (sternum) and at 0.05 mg/kg/day (parietal bones, major blood vessels). Irregular ossification and/or skeletal abnormalities occurred in the skull and jaw, vertebral and ribs, sternum, pelvis, tail, and scapula; and dose-dependent minor skeletal variations were observed. Visceral abnormalities occurred in blood vessels, lung, liver, and esophagus. Bilobed or bilocular gallbladder was seen in all treatment groups, but not in the control group.

In pregnant female rats given subcutaneous doses of 0.1, 0.25 and 1.0 mg/kg/day liraglutide from gestation day 6 through weaning or termination of nursing on lactation day 24, estimated systemic exposures were 0.8-, 3-, and 11-times human exposure at the MRHD of 1.8 mg/day, based on plasma AUC. A slight delay in parturition was observed in the majority of treated rats. Group mean body weight of neonatal rats from liraglutide-treated dams was lower than neonatal rats from control group dams. Bloody scabs and agitated behavior occurred in male rats descended from dams treated with 1 mg/kg/day liraglutide. Group mean body weight from birth to postpartum day 14 trended lower in F2 generation rats descended from liraglutide-treated rats compared to F2 generation rats descended from controls, but differences did not reach statistical significance for any group.

8.2 Lactation

Risk Summary

There are no data on the presence of VICTOZA® in human milk, the effects on the breastfed infant, or the effects on milk production. Liraglutide was present in milk of lactating rats [see Data].

Developmental and health benefits of breastfeeding should be considered along with the mother’s clinical need for VICTOZA® and any potential adverse effects on the breastfed infant from VICTOZA® or from the underlying maternal condition.

Data

In lactating rats, liraglutide was present unchanged in milk at concentrations approximately 50% of maternal plasma concentrations.

8.4 Pediatric Use

The safety and effectiveness of VICTOZA® as an adjunct to diet and exercise to improve glycemic control in type 2 diabetes mellitus have been established in pediatric patients 10 years of age and older. Use of VICTOZA® for this indication is supported by a 26-week placebo-controlled clinical trial and a 26-week open-label extension in 134 pediatric patients 10 to 17 years of age with type 2 diabetes, a pediatric pharmacokinetic study, and studies in adults with type 2 diabetes mellitus [see Clinical Pharmacology (12.3) and Clinical Studies (14.1,14.2)]. The risk of hypoglycemia was higher with VICTOZA® in pediatric patients regardless of insulin and/or metformin use.

The safety and effectiveness of VICTOZA® have not been established in pediatric patients less than 10 years of age.

8.5 Geriatric Use

In the VICTOZA® treatment arms of the glycemic control trials, a total of 832 (19.3%) of the patients were 65 to 74 years of age and 145 (3.4%) were 75 years of age and over. No overall differences in safety or efficacy were observed between these patients and younger patients, but greater sensitivity of some older individuals cannot be ruled out.

In the VICTOZA® treatment arm of the LEADER trial [see Clinical Studies (14.3)], a total of 1738 (37.2%) patients were 65 to 74 years of age, 401 (8.6%) were 75 to 84 years of age, and 17 (0.4%) were 85 years of age or older at baseline. No overall differences in safety or efficacy were observed between these patients and younger patients.

8.6 Renal Impairment

No dose adjustment of VICTOZA® is recommended for patients with renal impairment [see Clinical Pharmacology (12.3)]. The safety and efficacy of VICTOZA® was evaluated in a 26-week clinical study that included patients with moderate renal impairment (eGFR 30 to 60 mL/min/1.73m²) [see Clinical Studies (14.1)]. In the VICTOZA® treatment arm of the LEADER trial [see Clinical Studies (14.3)], 1932 (41.4%) patients had mild renal impairment, 999 (21.4%) patients had moderate renal impairment and 117 (2.5%) patients had severe renal impairment at baseline. No overall differences in safety or efficacy were seen in these patients compared to patients with normal renal function.

There is limited experience with VICTOZA® in patients with end stage renal disease. There have been postmarketing reports of acute renal failure and worsening of chronic renal failure, which may sometimes require hemodialysis [see Warnings and Precautions (5.5) and Adverse Reactions (6.2)]. Use caution in patients who experience dehydration.

8.7 Hepatic Impairment

There is limited experience in patients with mild, moderate or severe hepatic impairment. Therefore, VICTOZA® should be used with caution in this patient population. No dose adjustment of VICTOZA® is recommended for patients with hepatic impairment [see Clinical Pharmacology (12.3)].

8.8 Gastroaprosis

VICTOZA® slows gastric emptying. VICTOZA® has not been studied in patients with pre-existing gastroparesis.

10 OVERDOSE

Overdoses have been reported in clinical trials and post-marketing use of VICTOZA®. Observed effects have included severe nausea, severe vomiting, and severe hypoglycemia. In the event of overdose, appropriate supportive treatment should be initiated according to the patient’s clinical signs and symptoms.

11 DESCRIPTION

VICTOZA® contains liraglutide, an analog of human GLP-1 and acts as a GLP-1 receptor agonist. The peptide precursor of liraglutide, produced by a process that includes expression of recombinant DNA in Saccharomyces cerevisiae, has been engineered to be 97% homologous to native human GLP-1 by substituting arginine for lysine at position 34. Liraglutide is made by attaching a C-16 fatty acid (palmitic acid) with a glucamic acid spacer on the remaining lysine residue at position 26 of the peptide precursor. The molecular formula of liraglutide is C172H282O35S and the molecular weight is 3751.2 Dalton. The structural formula (Figure 1) is:

![Figure 1 Structural Formula of Liraglutide](image-url)
VICTOZA® injection is a sterile, aqueous, clear, colorless or almost colorless solution for subcutaneous use. Each 1 mL of VICTOZA® solution contains 6 mg of liraglutide and the following inactive ingredients: diosordum phosphate dihydrate, 1.42 mg, propylene glycol, 14 mg, phenol, 5.5 mg; and water for injection. VICTOZA® has a pH of approximately 8.15, hydrochloric acid or sodium hydroxide may be added to adjust pH. Each pre-filled pen contains a 3 mL solution of VICTOZA® equivalent to 18 mg liraglutide (free-base, anhydrous).

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action
Liraglutide is an acylated human Glucagon-Like Peptide-1 (GLP-1) receptor agonist with 97% amino acid sequence homology to endogenous human GLP-1 (7-37). GLP-1 (7-37) represents <20% of total circulating endogenous GLP-1. Like GLP-1 (7-37), liraglutide activates the GLP-1 receptor, a membrane-bound cell-surface receptor coupled to adenyl cyclase by the stimulatory G-protein, Gs, in pancreatic beta cells. Liraglutide increases intracellular cyclic AMP (cAMP) leading to insulin release in the presence of elevated glucose concentrations. This insulin secretion subsides as blood glucose concentrations decrease and approach euglycemia. Liraglutide also decreases glucagon secretion in a glucose-dependent manner. The mechanism of blood glucose lowering also involves a delay in gastric emptying.

GLP-1 (7-37) has a half-life of 1.5-2 minutes due to degradation by the ubiquitous endogenous enzymes, dipeptidyl peptidase IV (DPP-IV) and neutral endopeptidases (NEP). Unlike native GLP-1, liraglutide is stable against metabolic degradation by both peptides and has a plasma half-life of 13 hours after subcutaneous administration. The pharmacokinetic profile of liraglutide, which makes it suitable for once daily administration, is a result of self-association that delays absorption, plasma protein binding and stability against metabolic degradation by DPP-IV and NEP.

12.2 Pharmacodynamics
VICTOZA®s pharmacodynamic profile is consistent with its pharmacokinetic profile observed after single subcutaneous administration as VICTOZA® lowered fasting, premeal and postprandial glucose throughout the day [see Clinical Pharmacology (12.3)].

Fasting and postprandial glucose was measured before and up to 5 hours after a standardized meal after treatment to steady state with 0.6, 1.2 and 1.8 mg VICTOZA® or placebo. Compared to placebo, the postprandial plasma glucose AUC0-120min was 35% lower after VICTOZA® 1.2 mg and 38% lower after VICTOZA® 1.8 mg.

Glucose-dependent insulin secretion
The effect of a single dose of 7.5 mg/kg (~0.7 mg) VICTOZA® on insulin secretion rates (ISR) was investigated in 10 patients with type 2 diabetes during graded glucose infusion. In these patients, on average, the ISR response was increased in a glucose-dependent manner (Figure 2).

Figure 2  Mean Insulin Secretion Rate (ISR) versus Glucose Concentration Following Single-Dose VICTOZA® 7.5 mg/kg (~0.7 mg) or Placebo in Patients with Type 2 Diabetes (N=10) During Graded Glucose Infusion

Glucagon secretion
VICTOZA® lowered blood glucose by stimulating insulin secretion and lowering glucagon secretion. A single dose of VICTOZA® 7.5 mg/kg (~0.7 mg) did not impair glucagon response to low glucose concentrations.

Gastric emptying
VICTOZA® causes a delay of gastric emptying, thereby reducing the rate at which postprandial glucose appears in the circulation.

Cardiac Electrophysiology (QTc)
The effect of VICTOZA® on cardiac repolarization was tested in a QTc study. VICTOZA® at steady state concentrations with daily doses up to 1.8 mg did not produce QTc prolongation.

12.3 Pharmacokinetics
Absorption - Following subcutaneous administration, maximum concentrations of liraglutide are achieved at 8-12 hours post dosing. The mean peak (Cmax) and total (AUC) exposures of liraglutide were 35 ng/mL and 960 ng·h/mL, respectively, for a subcutaneous single dose of 0.6 mg. After subcutaneous single dose administrations, Cmax and AUC of liraglutide increased proportionally over the therapeutic dose range of 0.6 mg to 1.8 mg. At 1.8 mg VICTOZA®, the average steady state concentration of liraglutide over 24 hours was approximately 128 ng·h/mL. AUC0-∞ was equivalent between upper arm and abdomen, and between upper arm and thigh. AUC0-∞ from thigh was lower than that from abdomen. However, liraglutide exposures were considered comparable among these three subcutaneous injection sites. Absolute bioavailability of liraglutide following subcutaneous administration is approximately 55%.

Distribution - The mean apparent volume of distribution after subcutaneous administration of VICTOZA® 0.6 mg is approximately 13 L. The mean volume of distribution after intravenous administration of VICTOZA® is 0.07 L/kg. Liraglutide is extensively bound to plasma protein (~98%).

Metabolism - During the initial 24 hours following administration of a single (~14)liraglutide dose to healthy subjects, the major component in plasma was intact liraglutide. Liraglutide is endogenously metabolized in a similar manner to large proteins without a specific organ as a major route of elimination.

Elimination - Following a (~14)liraglutide dose, intact liraglutide was not detected in urine or feces. Only a minor part of the administered radioactivity was excreted as liraglutide-related metabolites in urine or feces (6% and 5%, respectively). The majority of urine and feces radioactivity was excreted during the first 6-9 days.

Hepatic Impairment
Patients with mild hepatic impairment (Child Pugh score >9) hepatic impairment were included in the trial. Compared to healthy subjects, liraglutide AUC in mild, moderate, and severe hepatic impairment and in end-stage renal disease was on average 35%, 19%, and 30% lower, respectively [see Use in Specific Populations (8.6)].

Renal Impairment
The single-dose pharmacokinetics of VICTOZA® were evaluated in patients with varying degrees of renal impairment. Patients with mild (estimated creatinine clearance 50-80 mL/min) to severe (estimated creatinine clearance <30 mL/min) renal impairment and subjects with end-stage renal disease requiring dialysis were included in the trial. Compared to healthy subjects, liraglutide AUC in mild, moderate, and severe renal impairment and in end-stage renal disease was on average 35%, 19%, and 30% lower, respectively [see Use in Specific Populations (8.7)].

Drug Interactions
In vitro assessment of drug-drug interactions VICTOZA® has low potential for pharmacokinetic drug-drug interactions related to cytochrome P450 (CYP) and plasma protein binding.

In vivo assessment of drug-drug interactions
The drug-drug interaction studies were performed at steady state with VICTOZA® 1.8 mg/day. Before administration of concomitant treatment, subjects underwent a 0.6 mg weekly dose increase to reach the maximum dose of 1.8 mg/day. Administration of the interacting drugs was timed so that Cmax of VICTOZA® (8-12 h) would coincide with the absorption peak of the co-administered drugs.

Doxigoxin
A single dose of digoxin 1 mg was administered 7 hours after the dose of VICTOZA® at steady state. The concomitant administration with VICTOZA® resulted in a reduction of digoxin AUC by 16%; Cmax decreased by 31%. Digoxin median time to maximal concentration (Tmax) was delayed from 1 h to 1.5 h.

Lisinopril
A single dose of lisinopril 20 mg was administered 5 minutes after the dose of VICTOZA® at steady state. The co-administration with VICTOZA® resulted in a reduction of lisinopril AUC by 15%; Cmax decreased by 27%. Lisinopril median Tmax was delayed from 6 h to 8 h with VICTOZA®.

Atravastatin
VICTOZA® did not change the overall exposure (AUC) of atorvastatin following a single dose of atrorvastatin 40 mg, administered 5 hours after the dose of VICTOZA® at steady state. Atravastatin Cmax was decreased by 38% and median Tmax was delayed from 1 h to 3 h with VICTOZA®.

Acamitinophen
VICTOZA® did not change the overall exposure (AUC) of acetaminophen following a single dose of acetaminophen 1000 mg, administered 8 hours after the dose of VICTOZA® at steady state. Acetaminophen Cmax was decreased by 31% and median Tmax was delayed up to 15 minutes.

Griseofulvin
VICTOZA® did not change the overall exposure (AUC) of griseofulvin following co-administration of a single dose of griseofulvin 500 mg with VICTOZA® at steady state. Griseofulvin Cmax increased by 37% while median Tmax did not change.

Insulin Detemir
No pharmacokinetic interaction was observed between VICTOZA® and insulin detemir when separate subcutaneous injections of insulin detemir 0.5 Unit/kg (single-dose) and VICTOZA® 1.8 mg (steady state) were administered in patients with type 2 diabetes.
13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

A 104-week carcinogenicity study was conducted in male and female Sprague Dawley rats at doses of 0.075, 0.25 and 0.75 mg/kg/day liraglutide administered by bolus subcutaneous injection with exposures 0.5-, 2-, and 8-times the human exposure, respectively, resulting from the MRHD based on plasma AUC comparison. A treatment-related increase in benign thyroid C-cell adenomas was observed in males in 0.25 and 0.75 mg/kg/day liraglutide groups with incidences of 12%, 27%, 33%, and 56% in 0 (control), 0.075, 0.25, and 0.75 mg/kg/day groups, respectively. A treatment-related increase in malignant thyroid C-cell carcinomas was observed in all male liraglutide-treated groups with incidences of 2%, 8%, 6%, and 14% and in females at 0.25 and 0.75 mg/kg/day with incidences of 0%, 0%, 4%, and 6% in 0 (control), 0.075, 0.25, and 0.75 mg/kg/day groups, respectively. Thyroid C-cell carcinomas are rare findings during carcinogenicity testing in rats. Studies in mice demonstrated that liraglutide-induced C-cell proliferation was dependent on the GLP-1 receptor and that liraglutide did not cause activation of the R\textsubscript{EM}arranged during Transfection (RET) proto-oncogene in thyroid C-cells.

Human relevance of thyroid C-cell tumors in mice and rats is unknown and has not been determined by clinical studies or nonclinical studies (see Boxed Warning and Warnings and Precautions (5.1)). Liraglutide was negative with and without metabolic activation in the Ames test for mutagenicity and in a human peripheral blood lymphocyte chromosome aberration test for clastogenicity. Liraglutide was negative in repeat-dose in vivo micronucleus tests in rats. In rat fertility studies using subcutaneous doses of 0.1, 0.25 and 1.0 mg/kg/day liraglutide, males were treated for 4 weeks prior to and throughout mating and females were treated 2 weeks prior to and throughout mating until gestation day 17. No direct adverse effects on male fertility were observed at doses up to 1.0 mg/kg/day, a high dose yielding an estimated systemic exposure 11-times the human exposure at the MRHD, based on plasma AUC. In female rats, an increase in early embryonic deaths occurred at 1.0 mg/kg/day. Reduced body weight gain and food consumption were observed in females at the 1.0 mg/kg/day dose.

14 CLINICAL STUDIES

14.1 Glycemic Control Trials in Adults with Type 2 Diabetes Mellitus

In glycemic control trials, VICTOZA® has been studied as monotherapy and in combination with one or two oral anti-diabetic medications or basal insulin. VICTOZA® was also studied in a cardiovascular outcomes trial (LEADER trial). In each of the placebo controlled trials, treatment with VICTOZA® produced clinically and statistically significant improvements in hemoglobin A\textsubscript{1c} and fasting plasma glucose (FPG) compared to placebo. All VICTOZA®-treated patients started at 0.6 mg/day. The dose was increased in weekly intervals by 0.6 mg to reach 1.2 mg or 1.8 mg for patients randomized to these higher doses. VICTOZA® 0.6 mg is not effective for glycemic control and is intended only as a starting dose to reduce gastrointestinal intolerance (see Dosage and Administration (2)).

Monotherapy

In this 52-week trial, 746 patients were randomized to VICTOZA® 1.2 mg, VICTOZA® 1.8 mg, or glimepiride 8 mg. Patients who were randomized to glimepiride were initially treated with 2 mg daily for two weeks, increasing to 4 mg daily for another two weeks, and finally increasing to 8 mg daily. Treatment with VICTOZA® 1.8 mg and 1.2 mg resulted in a statistically significant reduction in HbA\textsubscript{1c} compared to glimepiride (Table 3). The percentage of patients who discontinued due to ineffective therapy was 3.6% in the VICTOZA® 1.8 mg treatment group, 6.0% in the VICTOZA® 1.2 mg treatment group, and 10.1% in the glimepiride-treatment group.

The mean age of participants was 53 years, and the mean duration of diabetes was 5 years. Participants were 49.7% male, 77.5% White, 12.6% Black or African American and 35.0% of Hispanic ethnicity. The mean BMI was 33.1 kg/m\textsuperscript{2}.

<table>
<thead>
<tr>
<th>Table 3 Results of a 52-week monotherapy triala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment (N)</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Intent-to-Treatment Population (N)</td>
</tr>
<tr>
<td>Mean HbA\textsubscript{1c} (%) (Mean)</td>
</tr>
<tr>
<td>Baseline</td>
</tr>
<tr>
<td>Change from baseline (adjusted mean)§</td>
</tr>
<tr>
<td>Difference from glimepiride arm (adjusted mean)§</td>
</tr>
<tr>
<td>Least squares mean adjusted for baseline value</td>
</tr>
<tr>
<td>Body Weight (kg) (Mean)</td>
</tr>
<tr>
<td>Baseline</td>
</tr>
<tr>
<td>Change from baseline (adjusted mean)§</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
</tr>
</tbody>
</table>

*Intent-to-treatment population using last observation on study
§Least squares mean adjusted for baseline value

*p-value <0.05
*"p-value <0.001

Figure 3 Mean HbA\textsubscript{1c} for patients who completed the 52-week trial and for the Last Observation Carried Forward (LOCF, intent-to-treat) data at Week 52 (Monotherapy)

Combination Therapy

Add-on to Metformin

In this 26-week trial, 1091 patients were randomized to VICTOZA® 0.6 mg, VICTOZA® 1.2 mg, VICTOZA® 1.8 mg, placebo, or glimepiride 4 mg (one-half of the maximal approved dose in the United States), all as add-on to metformin. Randomization occurred after a 6-week run-in period consisting of a 3-week initial forced metformin titration period followed by a maintenance period of another 3 weeks. During the titration period, doses of metformin were increased up to 2000 mg/day. Treatment with VICTOZA® 1.2 mg and 1.8 mg as add-on to metformin resulted in a significant mean HbA\textsubscript{1c} reduction relative to placebo add-on to metformin and resulted in a similar mean HbA\textsubscript{1c} reduction relative to glimepiride 4 mg add-on to metformin (Table 4). The percentage of patients who discontinued due to ineffective therapy was 5.4% in the VICTOZA® 1.8 mg + metformin treatment group, 3.3% in the...
**VICTOZA® (liraglutide) injection 1.2 mg, 1.8 mg**

1.2 mg + metformin treatment group, 23.8% in the placebo + metformin treatment group, and 3.7% in the glimepiride + metformin treated group.

The mean age of participants was 57 years, and the mean duration of diabetes was 7 years. Participants were 58.2% male, 87.1% White and 2.4% Black or African American. The mean BMI was 31.0 kg/m².

<table>
<thead>
<tr>
<th>Table 4 Results of a 26-week trial of VICTOZA® as add-on to metformin*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intent-to-Treat Population (N)</strong></td>
</tr>
<tr>
<td>HbA1c (%) (Mean)</td>
</tr>
<tr>
<td>Baseline</td>
</tr>
<tr>
<td>Change from baseline (adjusted mean)**</td>
</tr>
<tr>
<td>Difference from placebo + metformin arm (adjusted mean)**</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
</tr>
<tr>
<td>Percentage of patients achieving HbA1c &lt;7%</td>
</tr>
</tbody>
</table>

**Fasting Plasma Glucose (mg/dL) (Mean)**

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Change from baseline (adjusted mean)**</th>
<th>Difference from placebo + metformin arm (adjusted mean)**</th>
<th>95% Confidence Interval</th>
<th>Difference from glimepiride + metformin arm (adjusted mean)**</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>181</td>
<td>-30</td>
<td>(-48, -27)</td>
<td>(-15, 3)</td>
<td></td>
</tr>
<tr>
<td>Change from baseline (adjusted mean)**</td>
<td>88.0</td>
<td>-2.6</td>
<td>-1.5</td>
<td>+1.0</td>
<td></td>
</tr>
<tr>
<td>Difference from placebo + metformin arm (adjusted mean)**</td>
<td>-2.8</td>
<td>-1.1*</td>
<td>(-2.0, -0.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(-4.5, -3.0)</td>
<td>(-4.3, -2.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference from glimepiride + metformin arm (adjusted mean)**</td>
<td>-3.8**</td>
<td>-3.5**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Body Weight (kg) (Mean)**

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Change from baseline (adjusted mean)**</th>
<th>Difference from placebo + metformin arm (adjusted mean)**</th>
<th>95% Confidence Interval</th>
<th>Difference from glimepiride + metformin arm (adjusted mean)**</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>181</td>
<td>-30</td>
<td>(-48, -27)</td>
<td>(-15, 3)</td>
<td></td>
</tr>
<tr>
<td>Change from baseline (adjusted mean)**</td>
<td>88.0</td>
<td>-2.6</td>
<td>-1.5</td>
<td>+1.0</td>
<td></td>
</tr>
<tr>
<td>Difference from placebo + metformin arm (adjusted mean)**</td>
<td>-2.8</td>
<td>-1.1*</td>
<td>(-2.0, -0.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(-4.5, -3.0)</td>
<td>(-4.3, -2.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference from glimepiride + metformin arm (adjusted mean)**</td>
<td>-3.8**</td>
<td>-3.5**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Table 5 Results of a 26-week open-label trial of VICTOZA® Compared to Sitagliptin (both in combination with metformin)**

<table>
<thead>
<tr>
<th><strong>Intent-to-Treat Population (N)</strong></th>
<th>VICTOZA® 1.8 mg + Metformin</th>
<th>VICTOZA® 1.2 mg + Metformin</th>
<th>Sitagliptin 100 mg + Metformin</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c (%) (Mean)</td>
<td>218</td>
<td>221</td>
<td>219</td>
</tr>
<tr>
<td>Baseline</td>
<td>8.4</td>
<td>8.4</td>
<td>8.5</td>
</tr>
<tr>
<td>Change from baseline (adjusted mean)**</td>
<td>-1.5</td>
<td>-1.5</td>
<td>-0.9</td>
</tr>
<tr>
<td>Difference from sitagliptin arm (adjusted mean)**</td>
<td>-0.7**</td>
<td>-0.7**</td>
<td>(-0.8, -0.4)</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>(-0.5, -0.2)</td>
<td>(-0.5, -0.2)</td>
<td></td>
</tr>
<tr>
<td>Percentage of patients achieving HbA1c &lt;7%</td>
<td>44</td>
<td>44</td>
<td>22</td>
</tr>
</tbody>
</table>

**Add-on to Sulfonylurea**

In this 26-week trial, 1041 patients were randomized to VICTOZA® 0.6 mg, VICTOZA® 1.2 mg, VICTOZA® 1.8 mg, placebo, or rosiglitazone 4 mg (one-half of the maximal approved dose in the United States), all as add-on to glimepiride. Randomization occurred after a 4-week run-in period consisting of an initial, 2-week, forced-glimepiride titration period followed by a maintenance period of another 2 weeks. During the titration period, doses of glimepiride were increased to 4 mg/day. The doses of glimepiride could be reduced (at the discretion of the investigator) from 4 mg/day to 3 mg/day or 2 mg/day (minimum) after randomization, in the event of unacceptable hypoglycemia or other adverse events.

The mean age of participants was 56 years, and the mean duration of diabetes was 8 years. Participants were 49.4% male, 64.4% White and 2.8% Black or African American. The mean BMI was 29.9 kg/m².

Treatment with insulin detemir as add-on to VICTOZA® 1.8 mg + metformin resulted in statistically significant reductions in HbA1c, and FPG compared to continued, unchanged treatment with VICTOZA® 1.8 mg + metformin alone (Table 7). From a mean baseline body weight of 56 kg after randomization, there was a mean reduction of 0.3 kg in the patients who received insulin detemir add-on therapy compared to a mean reduction of 1.1 kg in the patients who continued on unchanged treatment with VICTOZA® 1.8 mg + metformin alone.

**Table 6 Results of a 26-week open-label trial of Insulin detemir as add on to VICTOZA® + metformin compared to continued treatment with VICTOZA® + metformin in patients not achieving HbA1c <7% after 12 weeks of Metformin and VICTOZA**

<table>
<thead>
<tr>
<th><strong>Intent-to-Treat Population (N)</strong></th>
<th>Insulin detemir + VICTOZA® + Metformin</th>
<th>VICTOZA® + Metformin</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c (%) (Mean)</td>
<td>162</td>
<td>167</td>
</tr>
<tr>
<td>Baseline (week 0)</td>
<td>7.8</td>
<td>7.6</td>
</tr>
<tr>
<td>Change from baseline (adjusted mean)</td>
<td>-0.5**</td>
<td>0</td>
</tr>
<tr>
<td>Difference from VICTOZA® + metformin arm (LS mean)**</td>
<td>(-0.7, -0.4)</td>
<td>17</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Percentage of patients achieving HbA1c &lt;7%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Add-on to Sulfonylurea**

In this 26-week trial, 1041 patients were randomized to VICTOZA® 0.6 mg, VICTOZA® 1.2 mg, VICTOZA® 1.8 mg, placebo, or rosiglitazone 4 mg (one-half of the maximal approved dose in the United States), all as add-on to glimepiride. Randomization occurred after a 4-week run-in period consisting of an initial, 2-week, forced-glimepiride titration period followed by a maintenance period of another 2 weeks. During the titration period, doses of glimepiride were increased to 4 mg/day. The doses of glimepiride could be reduced (at the discretion of the investigator) from 4 mg/day to 3 mg/day or 2 mg/day (minimum) after randomization, in the event of unacceptable hypoglycemia or other adverse events.

The mean age of participants was 56 years, and the mean duration of diabetes was 8 years. Participants were 49.4% male, 64.4% White and 2.8% Black or African American. The mean BMI was 29.9 kg/m².

Treatment with VICTOZA® 1.2 mg and 1.8 mg as add-on to glimepiride resulted in a statistically significant reduction in mean HbA1c compared to placebo add-on to glimepiride (Table 7). The percentage of patients who discontinued due to ineffective therapy was 3.0% in the VICTOZA® 1.8 mg + glimepiride treatment group, 3.5% in the VICTOZA® 1.2 mg + glimepiride treatment group, 17.5% in the placebo + glimepiride treatment group, and 9.3% in the rosiglitazone + glimepiride treatment group.

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*Least squares mean adjusted for baseline value
**p-value <0.0001
*Least squares mean adjusted for baseline value
**p-value <0.0001
Table 7 Results of a 26-week trial of VICTOZA® as add-on to sulfonylurea

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Intent-to-Treat Population (N)</th>
<th>HbA1c (%) (Mean)</th>
<th>Fasting Plasma Glucose (mg/dL) (Mean)</th>
<th>Body Weight (kg) (Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VICTOZA® 1.8 mg + Glimepiride</td>
<td>234</td>
<td>8.1</td>
<td>95% CI: 7.8, 8.4</td>
<td>80.6</td>
</tr>
<tr>
<td>VICTOZA® 1.2 mg + Glimepiride</td>
<td>228</td>
<td>8.0</td>
<td>95% CI: 7.8, 8.3</td>
<td>79.8</td>
</tr>
<tr>
<td>Placebo + Glimepiride</td>
<td>114</td>
<td>8.2</td>
<td>95% CI: 7.9, 8.5</td>
<td>80.2</td>
</tr>
<tr>
<td>Rosiglitazone 4 mg + Glimepiride</td>
<td>231</td>
<td>8.2</td>
<td>95% CI: 8.0, 8.5</td>
<td>80.3</td>
</tr>
</tbody>
</table>

* Intent-to-treatment population using last observation on study

Table 8 Results of a 26-week trial of VICTOZA® as add-on to metformin and sulfonylurea

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Intent-to-Treat Population (N)</th>
<th>HbA1c (%) (Mean)</th>
<th>Fasting Plasma Glucose (mg/dL) (Mean)</th>
<th>Body Weight (kg) (Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VICTOZA® 1.8 mg + Metformin + Glimepiride</td>
<td>230</td>
<td>8.3</td>
<td>95% CI: 8.0, 8.6</td>
<td>80.6</td>
</tr>
<tr>
<td>Placebo + Metformin + Glimepiride</td>
<td>114</td>
<td>8.1</td>
<td>95% CI: 7.8, 8.4</td>
<td>80.1</td>
</tr>
<tr>
<td>Insulin glargine 1c + Metformin + Glimepiride</td>
<td>232</td>
<td>8.1</td>
<td>95% CI: 7.8, 8.4</td>
<td>80.3</td>
</tr>
</tbody>
</table>

* Intent-to-treatment population using last observation on study

Table 9 Results of a 26-week open-label trial of VICTOZA® versus Exenatide (both in combination with metformin and/or sulfonylurea)

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Intent-to-Treat Population (N)</th>
<th>HbA1c (%) (Mean)</th>
<th>Fasting Plasma Glucose (mg/dL) (Mean)</th>
<th>Body Weight (kg) (Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VICTOZA® 1.8 mg once daily + metformin and/or sulfonylurea</td>
<td>233</td>
<td>8.2</td>
<td>95% CI: 8.0, 8.4</td>
<td>80.4</td>
</tr>
<tr>
<td>Exenatide 10 mcg twice daily + metformin and/or sulfonylurea</td>
<td>231</td>
<td>8.1</td>
<td>95% CI: 7.9, 8.3</td>
<td>80.1</td>
</tr>
</tbody>
</table>

* Intent-to-treatment population using last observation carried forward

Table 10 Results of a 26-week trial of VICTOZA® as add-on to metformin and thiazolidinedione

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Intent-to-Treat Population (N)</th>
<th>HbA1c (%) (Mean)</th>
<th>Fasting Plasma Glucose (mg/dL) (Mean)</th>
<th>Body Weight (kg) (Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VICTOZA® 1.8 mg + Metformin + Rosiglitazone</td>
<td>178</td>
<td>8.1</td>
<td>95% CI: 7.9, 8.4</td>
<td>80.2</td>
</tr>
<tr>
<td>Placebo + Metformin + Rosiglitazone</td>
<td>177</td>
<td>8.2</td>
<td>95% CI: 8.0, 8.5</td>
<td>80.3</td>
</tr>
<tr>
<td>VICTOZA® 1.2 mg + Metformin + Rosiglitazone</td>
<td>175</td>
<td>8.1</td>
<td>95% CI: 7.9, 8.4</td>
<td>80.1</td>
</tr>
</tbody>
</table>

* Intent-to-treatment population using last observation on study

In this 26-week trial, 581 patients were randomized to VICTOZA® 1.8 mg, placebo, or insulin glargine, all as add-on to metformin and glimepiride. Randomization took place after a 6–week run-in period consisting of a 3-week forced metformin and glimepiride titration period followed by a maintenance period of another 3 weeks. During the titration period, doses of metformin and glimepiride were to be increased up to 2000 mg/day and 4 mg/day, respectively. After randomization, patients randomized to VICTOZA® 1.8 mg underwent a 2-week period of titration with VICTOZA® 1.8 mg. During the titration period, the VICTOZA® and metformin doses were fixed, although glimepiride and insulin glargine doses could be adjusted. Patients titrated glargine twice-weekly during the first 8 weeks of treatment based on self-measured fasting plasma glucose on the day of titration. After Week 8, the frequency of insulin glargine titration was left to the discretion of the investigator, but, at a minimum, the glargine dose was to be revised, if necessary, after Weeks 12 and 18. Only 20% of glimepirate-treated patients achieved the pre-specified target fasting plasma glucose of ≤100 mg/dL. Therefore, optimal titration of the insulin glargine dose was not achieved in most patients.

The mean age of participants was 58 years, and the mean duration of diabetes was 9 years. Participants were 56.5% male, 75.0% White and 3.6% Black or African American. The mean BMI was 30.5 kg/m². Treatment with VICTOZA® as add-on to glimepiride and metformin resulted in a statistically significant mean reduction in HbA1c compared to placebo add-on to glimepiride and metformin (Table 8). The percentage of patients who discontinued due to ineffective therapy was 9.9% in the VICTOZA® 1.8 mg + metformin + glimepiride group, 3.4% in the sulfonylurea group, and 13.3% in the placebo + metformin + glimepiride + treatment group.

In this 26-week trial, 533 patients were randomized to VICTOZA® 1.2 mg, VICTOZA® 1.8 mg or placebo, all as add-on to rosiglitazone (8 mg) plus metformin (2000 mg). Patients underwent a 9-week run-in period (3-week forced dose escalation followed by a 6-week dose maintenance phase) with rosiglitazone (starting at 4 mg and increasing to 8 mg/day within 2 weeks) and metformin (starting at 500 mg with increasing weekly increments of 500 mg to a final dose of 2000 mg/day). Only patients who tolerated the final dose of rosiglitazone (8 mg/day) and metformin (2000 mg/day) and completed the 6-week dose maintenance phase were eligible for randomization into the trial.

The mean age of participants was 55 years, and the mean duration of diabetes was 9 years. Patients were 61.6% male, 84.2% White, 10.2% Black or African American and 16.4% of Hispanic ethnicity. The mean BMI was 33.9 kg/m². Treatment with VICTOZA® as add-on to metformin and rosiglitazone produced a statistically significant reduction in mean HbA1c compared to placebo add-on to metformin and rosiglitazone (Table 8). The percentage of patients who discontinued due to ineffective therapy was 1.7% in the VICTOZA® 1.8 mg + metformin + rosiglitazone treatment group, 1.7% in the VICTOZA® 1.2 mg + metformin + rosiglitazone treatment group, and 1.6% in the placebo + metformin + rosiglitazone treatment group.
In this 26-week, double-blind, randomized, placebo-controlled, parallel-group trial, 279 patients with moderate renal impairment, as per MODIS formula (eGFR 30–59 mL/min/1.73 m²), were randomized to VICTOZA® or placebo once daily. VICTOZA® was added to the patient’s stable pre-trial antidiabetic regimen (insulin therapy and/or metformin, pioglitazone, or sulfonylurea). The dose of VICTOZA® was escalated according to approved labeling to achieve a dose of 1.8 mg per day. The insulin dose was reduced by 20% at randomization for patients with baseline HbA₁c ≤ 8% and fixed until lixisenatide dose escalation was complete. Dose reduction of insulin and SU was allowed in cases of hypoglycemia; up titration of insulin was allowed but not beyond the pre-trial dose.

The mean age of participants was 67 years, and the mean duration of diabetes was 15 years. Participants were 50.5% male, 92.3% White, 6.6% Black or African American, and 7.2% of Hispanic ethnicity. The mean BMI was 33.9 kg/m². Approximately half of patients had an eGFR between 30 and <45 mL/min/1.73 m².

Treatment with VICTOZA® resulted in a statistically significant reduction in HbA₁c from baseline at Week 26 compared to placebo (see Table 11). 123 patients reached the 1.8 mg dose of VICTOZA®.

### Table 11 Results of a 26-week trial of VICTOZA® compared to placebo in Patients with Renal Impairment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>VICTOZA® 1.8 mg + insulin and/or OAD</th>
<th>Placebo + insulin and/or OAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intent to Treat Population (N)</td>
<td>140</td>
<td>137</td>
</tr>
<tr>
<td>HbA₁c (%)</td>
<td>8.1</td>
<td>8.0</td>
</tr>
<tr>
<td>Baseline (mean)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change from baseline (estimated mean)</td>
<td>-0.9</td>
<td>-0.4</td>
</tr>
<tr>
<td>Difference from placebo (95% Confidence Interval)</td>
<td>-0.6**</td>
<td>(-0.8, -0.3)</td>
</tr>
<tr>
<td>Proportion achieving HbA₁c &lt; 7%</td>
<td>39.3</td>
<td>19.7</td>
</tr>
<tr>
<td>FPG (mg/dL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline (mean)</td>
<td>171</td>
<td>157</td>
</tr>
<tr>
<td>Change from baseline (estimated mean)</td>
<td>-22</td>
<td>-10</td>
</tr>
<tr>
<td>Difference from placebo (95% Confidence Interval)</td>
<td>-12**</td>
<td>(-23, -8)</td>
</tr>
</tbody>
</table>

### 14.3 Cardiovascular Outcomes Trial in Patients with Type 2 Diabetes Mellitus and Atherosclerotic Cardiovascular Disease

The LEADER trial (NCT01179904) was a multi-national, multi-center, placebo-controlled, double-blind trial. In this study, 9340 patients with inadequately controlled type 2 diabetes and atherosclerotic cardiovascular disease were randomized to VICTOZA® 1.8 mg or placebo for a median duration of 3.5 years. The study compared the risk of major adverse cardiovascular events between VICTOZA® and placebo when these were added to, and used concomitantly with, background standard of care treatments for type 2 diabetes. The primary endpoint, MACE, was the time to first occurrence of a three part composite outcome which included; cardiovascular death, non-fatal myocardial infarction and non-fatal stroke.

Patients eligible to enter the trial were: 50 years of age or older and had established, stable, cardiovascular, cerebrovascular, peripheral artery disease, chronic kidney disease or NYHA class II and III heart failure (80% of the enrolled population) or were 60 years of age or older and had other specified risk factors for cardiovascular disease (20% of the enrolled population).

At baseline, demographic and disease characteristics were balanced. The mean age was 64 years and the population was 64.3% male, 77.5% Caucasian, 10.0% Asian, and 8.3% Black. In the study, 12.1% of the population identified as Hispanic or Latino. The mean duration of type 2 diabetes was 12.8 years, the mean HbA₁c was 8.7% and the mean BMI was 32.5 kg/m². A history of previous myocardial infarction was reported in 31% of randomized individuals, a prior revascularization procedure in 39%, a prior ischemic stroke in 11%, documented symptomatic coronary disease in 9%, documented asymptomatic cardiac ischemia in 26%, and a diagnosis of NYHA class II to III heart failure in 14%. The mean eGFR at baseline was 79 mL/min/1.73 m² and 41.8% of patients had mild renal impairment (eGFR 60 mL/min/1.73 m²), 20.7% had moderate renal impairment (eGFR 30 to 60 mL/min/1.73 m²) and 2.4% of patients had severe renal impairment (eGFR < 30 mL/min/1.73 m²).

At baseline, patients treated their diabetes with; diet and exercise only (3.9%), oral antidiabetic drugs only (51.5%), oral antidiabetic drugs and insulin (36.7%) or insulin only (7.9%). The most common background antidiabetic drugs used at baseline and in the trial were metformin, sulfonylurea and insulin. Use of DPP-4 inhibitors and other GLP-1 receptor agonists was excluded by protocol and SGLT-2 inhibitors were either not approved or not widely available. At baseline, cardiovascular disease and risk factors were managed with; non-diuretic antihypertensives (92.4%), diuretics (41.8%), statin therapy (72.1%) and platelet aggregation inhibitors (68.8%). During the trial, investigators could modify anti-diabetic and cardiovascular medications to achieve local standard of care treatment targets with respect to blood glucose, lipid, and blood pressure, and manage patients recovering from an acute coronary syndrome or stroke event per local treatment guidelines.

For the primary analysis, a Cox proportional hazards model was used to test for non-inferiority against the pre-specified risk margin of 1.3 for the hazard ratio of MACE and to test for superiority on MACE if non-inferiority was demonstrated. Type 1 error was controlled across multiple tests.

VICTOZA® significantly reduced the occurrence of MACE. The estimated hazard ratio (95% CI) for time to first MACE was 0.87 (0.78, 0.97). Refer to Figure 5 and Table 13.

Vital status was available for 99.7% of subjects in the trial. A total of 828 deaths were recorded during the LEADER trial. A majority of the deaths in the trial were categorized as cardiovascular deaths and non-cardiovascular deaths were balanced between the treatment groups (3.5% in patients treated with VICTOZA® and 3.6% in patients treated with placebo). The estimated hazard ratio of time to all-cause death for VICTOZA® compared to placebo was 0.85 (0.74, 0.97).

Table 12 Results at week 26 in a trial comparing VICTOZA® in combination with metformin with or without basal insulin versus Placebo in combination with metformin with or without basal insulin in Pediatric Patients 10 Years of Age and Older with Type 2 Diabetes Mellitus

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Placebo+metformin and/or OAD</th>
<th>VICTOZA®+metformin and/or OAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>HbA₁c (%)</td>
<td>7.9</td>
<td>7.7</td>
</tr>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of 26 weeks</td>
<td>7.1</td>
<td>8.2</td>
</tr>
<tr>
<td>Adjusted mean change from baseline after 26 weeks</td>
<td>-0.64</td>
<td>0.42</td>
</tr>
<tr>
<td>Treatment difference [95% CI]</td>
<td>VICTOZA® vs Placebo</td>
<td>-1.06 [-1.65; -0.46]</td>
</tr>
<tr>
<td>Percentage of patients achieving HbA₁c &lt; 7%</td>
<td>63.7</td>
<td>36.5</td>
</tr>
<tr>
<td>FPG (mg/dL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>157</td>
<td>147</td>
</tr>
<tr>
<td>End of 26 weeks</td>
<td>132</td>
<td>165</td>
</tr>
<tr>
<td>Adjusted mean change from baseline after 26 weeks</td>
<td>-19.4</td>
<td>14.4</td>
</tr>
<tr>
<td>Treatment difference [95% CI]</td>
<td>VICTOZA® vs Placebo</td>
<td>-33.83 [-55.74; -11.92]</td>
</tr>
</tbody>
</table>
VICTOZA® (liraglutide) injection 1.2 mg, 1.8 mg

219 (4.7%) 24
should be stored in a refrigerator between 36ºF to 46ºF (2ºC to 8ºC). Do

Injection: 18 mg/3 mL (6 mg/mL) clear, colorless solution in a pre-filled, single-patient-use
pen, the pen can be stored for 30 days at controlled room temperature
12
promptly and contact their

is a registered trademark of Novo Nordisk A/S.

pen without an injection needle attached. This will

at 0.6 mg to mitigate

is used with insulin secreta

should be titrated at

177 (3.8%)

from excessive heat and sunlight. Always remove and safely discard the

608 (13.0%)

of the potential risk of dehydration due to gastrointestinal

30
0.88 (0.75;1.03)

54
159 (3.4%)

48
12

Inform patients of the potential risk for pancreatitis. Explain that persistent severe abdominal pain
that may radiate to the back and which may or may not be accompanied by vomiting, is the hallmark
symptom of acute pancreatitis. Instruct patients to discontinue VICTOZA® promptly and contact their
physician if persistent severe abdominal pain occurs [see Warnings and Precautions (5.2)].

Acute Gallbladder Disease
Inform patients of the potential risk for cholecystitis or cholelithiasis. Instruct patients to contact their
physician if cholelithiasis or cholecystitis is suspected for appropriate clinical follow-up.

Never Share a VICTOZA® Pen Between Patients
Advisers that they must never share a VICTOZA® pen with another person, even if the needle is
changed, because doing so carries a risk for transmission of blood-borne pathogens.

Hypoglycemia
Inform patients that hypoglycemia has been reported when VICTOZA® is used with insulin secreta-
gogues or insulin and may occur in pediatric patients regardless of concomitant antidiabetic treatment.
Educate patients or caregivers on the signs and symptoms of hypoglycemia.

Figure 5 Kaplan-Meier: Time to First Occurrence of a MACE in the LEADER Trial
(Patients with T2DM and Atherosclerotic CVD)

Table 13 Treatment Effect for the Primary Composite Endpoint, MACE, and its
Components in the LEADER Trial (Patients with T2DM and Atherosclerotic CVD)"
What is VICTOZA®?
VICTOZA® is an injectable prescription medicine used:
• along with diet and exercise to lower blood sugar (glucose) in adults and children who are 10 years of age and older with type 2 diabetes mellitus.
• to reduce the risk of major cardiovascular events such as heart attack, stroke or death in adults with type 2 diabetes mellitus with known heart disease.

WHO SHOULD NOT USE VICTOZA®?
Do not use VICTOZA® if:
• you or any of your family have ever had a type of thyroid cancer called medullary thyroid carcinoma (MTC) or if you have an endocrine system condition called Multiple Endocrine Neoplasia syndrome type 2 (MEN 2).
• you are allergic to liraglutide or any of the ingredients in VICTOZA®.
• you or any of your family have ever had problems with your pancreas, kidneys, or liver.
• you are allergic to liraglutide or any of the ingredients in VICTOZA®.
• you or any of your family have ever had a type of thyroid cancer called medullary thyroid carcinoma (MTC), or if you have an endocrine system condition called Multiple Endocrine Neoplasia syndrome type 2 (MEN 2).

Tell your healthcare provider before using VICTOZA® if:
• you are allergic to liraglutide or any of the ingredients in VICTOZA®.
• you have or have had problems with your pancreas, kidneys, or liver.
• you have severe problems with your stomach, such as slowed emptying of your stomach (gastroparesis) or problems with digesting food.
• you are pregnant or plan to become pregnant. It is not known if VICTOZA® will harm your unborn baby. Tell your healthcare provider if you become pregnant while using VICTOZA®.
• you are breastfeeding or plan to breastfeed. It is not known if VICTOZA® passes into your breast milk. You should talk with your healthcare provider about the best way to feed your baby while using VICTOZA®.
• you have or have had problems with your pancreas, kidneys, or liver.
• you have severe problems with your stomach, such as slowed emptying of your stomach (gastroparesis) or problems with digesting food.
• you are pregnant or plan to become pregnant. It is not known if VICTOZA® will harm your unborn baby. Tell your healthcare provider if you become pregnant while using VICTOZA®.
• you are breastfeeding or plan to breastfeed. It is not known if VICTOZA® passes into your breast milk. You should talk with your healthcare provider about the best way to feed your baby while using VICTOZA®.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements. VICTOZA® may affect the way some medicines work and some medicines may affect the way VICTOZA® works.

Before using VICTOZA®, talk to your healthcare provider about low blood sugar and how to manage it. Tell your healthcare provider if you are taking other medicines to treat diabetes, including insulin or sulfonylureas.

Know the medicines you take. Keep a list of them to show your healthcare provider and pharmacist when you get a new medicine.

What are the possible side effects of VICTOZA®?
VICTOZA® may cause serious side effects, including:
• See “What is the most important information I should know about VICTOZA®?”
• inflammation of your pancreas (pancreatitis). Stop using VICTOZA® and call your healthcare provider right away if you have severe pain in your stomach area (abdomen) that will not go away, with or without vomiting. You may feel the pain from your abdomen to your back.
• low blood sugar (hypoglycemia). Your risk for getting low blood sugar may be higher if you use VICTOZA® with another medicine that can cause low blood sugar, such as a sulfonylurea or insulin. In children who are 10 years of age and older, the risk for low blood sugar may be higher with VICTOZA® regardless of use with another medicine that can also lower blood sugar.

Signs and symptoms of low blood sugar may include:
• dizziness or light-headedness
• blurred vision
• anxiety, irritability, or mood changes
• sweating
• slurred speech
• hunger
• confusion or drowsiness
• shakiness
• weakness
• headache
• fast heartbeat
• feeling jittery
• kidney problems (kidney failure). In people who have kidney problems, diarrhea, nausea, and vomiting may cause a loss of fluids (dehydration) which may cause kidney problems to get worse.
• serious allergic reactions. Stop using VICTOZA® and get medical help right away, if you have any symptoms of a serious allergic reaction including:
  • swelling of your face, lips, tongue or throat
  • fainting or feeling dizzy
  • problems breathing or swallowing
  • severe rash or itching
  • very rapid heartbeat
• gallbladder problems. Gallbladder problems have happened in some people who take VICTOZA®. Tell your healthcare provider right away if you get symptoms of gallbladder problems which may include:
  • pain in the right or middle upper stomach area
  • nausea and vomiting
  • fever
  • your skin or the white part of your eyes turn yellow

The most common side effects of VICTOZA® may include:
• nausea, diarrhea, vomiting, decreased appetite, indigestion and constipation.

Talk to your healthcare provider about any side effect that bothers you or does not go away. These are not all the possible side effects of VICTOZA®. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

General information about the safe and effective use of VICTOZA®.
Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use VICTOZA® for a condition for which it was not prescribed. Do not give VICTOZA® to other people, even if they have the same symptoms that you have. It may harm them. If you would like more information, talk with your healthcare provider. You can ask your pharmacist or healthcare provider for information about VICTOZA® that is written for health professionals.

What are the ingredients in VICTOZA®?
Active Ingredients: Liraglutide
Inactive Ingredients: disodium phosphate dihydrate, propylene glycol, phenol and water for injection

This Medication Guide has been approved by the U.S. Food and Drug Administration.
Instructions for Use
Victoza® (liraglutide) injection

Victoza® Pen
Pen cap
Rubber stopper
Cartridge tip
Cartridge scale
Dose display
Dose button
Flow check symbol

Needle (example)
Outer needle cap
Inner needle cap
Needle
Protective tab

If you are having problems using your Victoza® pen, call toll free 1-877-484-2869 or visit victoza.com.

First read the Medication Guide that comes with your Victoza® single-patient-use pen and then read this Patient Instructions for Use for information about how to use your Victoza® pen the right way. These instructions do not take the place of talking with your healthcare provider about your medical condition or your treatment.

Do not share your Victoza® Pen with other people, even if the needle has been changed. You may give other people a serious infection, or get a serious infection from them.

Your Victoza® pen is a disposable single-patient-use prefilled pen injector that contains 3 mL of Victoza® and will deliver doses of 0.6 mg, 1.2 mg or 1.8 mg. The number of doses that you can take with a Victoza® pen depends on the dose of medicine that is prescribed for you. Your healthcare provider will tell you how much Victoza® to take. Victoza® pen should be used with Novo Nordisk disposable needles.

Talk to your healthcare provider or pharmacist for more information about needles for your Victoza® pen.

Important Information
Always use a new needle for each injection to prevent contamination.
Always remove the needle after each injection, and store your pen without the needle attached. This reduces the risk of contamination, infection, leakage of liraglutide, blocked needles and inaccurate dosing.
Keep your Victoza® pen and all medicines out of the reach of children.
If you drop your Victoza® pen, repeat “First Time Use For Each New Pen” (steps A through D).
Be careful not to bend or damage the needle.
Do not use the cartridge scale to measure how much Victoza® to inject.
Be careful when handling used needles to avoid needle stick injuries.
You can use your Victoza® pen for up to 30 days after you use it the first time.

First Time Use for Each New Pen
Step A. Check the Pen
Take your new Victoza® pen out of the refrigerator.
Wash hands with soap and water before use.
Check pen label before each use to make sure it is your Victoza® pen.
Pull off pen cap (See Figure A).
Check Victoza® in the cartridge. The liquid should be clear, colorless and free of particles. If not, do not use.
Wipe the rubber stopper with an alcohol swab.

Step B. Attach the Needle
Remove protective tab from outer needle cap (See Figure B).
Push outer needle cap containing the needle straight onto the pen, then screw needle on until secure.
Pull off outer needle cap (See Figure C). Do not throw away.
Pull off inner needle cap and throw away (See Figure D). A small drop of liquid may appear. This is normal.

Step C. Dial to the Flow Check Symbol
This step is done only once for each new pen and is only required the first time you use a new pen.
Turn dose selector until flow check symbol (--) lines up with pointer (See Figure E). The flow check symbol does not administer the dose as prescribed by your healthcare provider.
To select the dose prescribed by your healthcare provider, continue to Step G under “Routine Use”.

Step D. Prepare the Pen
Hold pen with needle pointing up.
Tap cartridge gently with your finger a few times to bring any air bubbles to the top of the cartridge (See Figure F).
Keep needle pointing up and press dose button until 0 mg lines up with pointer (See Figure G). Repeat steps C and D, up to 6 times, until a drop of Victoza® appears at the needle tip.

If you still see no drop of Victoza®, use a new pen and contact Novo Nordisk at 1-877-484-2869.

Continue to Step G under “Routine Use”

Routine Use
Step E. Check the Pen
Take your Victoza® pen from where it is stored.
Wash hands with soap and water before use.
Check pen label before each use to make sure it is your Victoza® pen.
Pull off pen cap (See Figure H).
Check Victoza® in the cartridge. The liquid should be clear, colorless and free of particles. If not, do not use.
Wipe the rubber stopper with an alcohol swab.

Step F. Attach the Needle
Remove protective tab from outer needle cap.
Push outer needle cap containing the needle straight onto the pen, then screw needle on until secure (See Figure I).
Pull off outer needle cap. Do not throw away (See Figure J).
Pull off inner needle cap and throw away (See Figure K). A small drop of liquid may appear. This is normal.

Step G. Dial the Dose
Victoza® pen can give a dose of 0.6 mg (starting dose), 1.2 mg or 1.8 mg. Be sure that you know the dose of Victoza® that is prescribed for you.
Turn the dose selector until your needed dose lines up with the pointer (0.6 mg, 1.2 mg or 1.8 mg) (See Figure L).
You will hear a “click” every time you turn the dose selector. Do not set the dose by counting the number of clicks you hear.
If you select a wrong dose, change it by turning the dose selector backwards or forwards until the correct dose lines up with the pointer. Be careful not to press the dose button when turning the dose selector.
This may cause Victoza® to come out.

Step H. Injecting the Dose
Insert needle into your skin in the stomach (abdomen), thigh or upper arm. Use the injection technique shown to you by your healthcare provider. Do not inject Victoza® into a vein or muscle.
Press down on the center of the dose button to inject until 0 mg lines up with the pointer (See Figure M).
Be careful not to touch the dose display with your fingers. This may block the injection.
Keep the dose button pressed down and make sure that you keep the needle under the skin for a full count of 6 seconds to make sure the full dose is injected. Keep your thumb on the injection button until you remove the needle from your skin (See Figure N).
Change (rotate) your injection sites within the area you choose for each dose. Do not use the same injection site for each injection.

Step I. Withdraw Needle
You may see a drop of Victoza® at the needle tip. This is normal and it does not affect the dose you just received. If blood appears after you take the needle out of your skin, apply light pressure, but do not rub the area (See Figure O).

Step J. Remove and Dispose of the Needle
Carefully put the outer needle cap over the needle (See Figure P). Unscrew the needle.
Safety remove the needle from your Victoza® pen after each use.
Put your used VICTOZA® pen and needles in a FDA-cleared sharps disposal container right away after use. Do not throw away (dispose of) loose needles and pens in your household trash.
If you do not have a FDA-cleared sharps disposal container, you may use a household container that is:
• made of a heavy-duty plastic
• can be closed with a tight-fitting, puncture-resistant lid, without sharpings being able to come out
• upright and stable during use
• leak-resistant
• properly labeled to warn of hazardous waste inside the container
When your sharps disposal container is almost full, you will need to follow your community guidelines for the right way to dispose of your sharps disposal container. There may be state or local laws about how you should throw away used needles and syringes. Do not reuse or share your needles with other people. For more information about the safe sharps disposal, and for specific information about sharps disposal in the state that you live in, go to the FDA’s website at: http://www.fda.gov/safesharpsdisposal.
Do not dispose of your used sharps disposal container in your household trash unless your community guidelines permit this. Do not recycle your used sharps disposal container.

Caring for your Victoza® pen
After removing the needle, put the pen cap on your Victoza® pen and store your Victoza® pen without the needle attached (See Figure Q).
Do not try to refill your Victoza® pen – it is prefilled and is disposable.
Do not try to repair your pen or pull it apart.
Keep your Victoza® pen away from dust, dirt and liquids.
If cleaning is needed, wipe the outside of the pen with a clean, damp cloth.
How should I store Victoza®?

Before use:
- Store your new, unused Victoza® pen in the refrigerator at 36°F to 46°F (2°C to 8°C).
- If Victoza® is stored outside of refrigeration (by mistake) prior to first use, it should be used or thrown away within 30 days.
- Do not freeze Victoza® or use Victoza® if it has been frozen. Do not store Victoza® near the refrigerator cooling element.

Pen in use:
- Use a Victoza® pen for only 30 days. Throw away a used Victoza® pen 30 days after you start using it, even if some medicine is left in the pen.
- Store your Victoza® pen at 59°F to 86°F (15°C to 30°C), or in a refrigerator at 36°F to 46°F (2°C to 8°C).
- When carrying the pen away from home, store the pen at a temperature between 59°F to 86°F (15°C to 30°C).
- If Victoza® has been exposed to temperatures above 86°F (30°C), it should be thrown away.
- Protect your Victoza® pen from heat and sunlight.
- Keep the pen cap on when your Victoza® pen is not in use.
- Always remove the needle after each injection and store your pen without the needle attached. This reduces the risk of contamination, infection, leakage and inaccurate dosing.